

WMD Radiological/Nuclear Course for HazMat Technicians (PER-241)

Course Syllabus

A U.S. Department of Homeland Security (DHS) Office for Domestic Preparedness (ODP) training course delivered by the U.S. Department of Energy, National Nuclear Security Administration, Nevada Site Office (DOE/NNSA/NSO), National Center for Exercise Excellence (NCEE), at the Nevada Test Site (NTS), a member of the National Domestic Preparedness Consortium (NDPC) through Bechtel Nevada (BN), Counter Terrorism Operations Support (CTOS) Program.

Course Description:

The course prepares the hazardous materials (HazMat) technician to respond to an incident involving a radiological or nuclear weapon of mass destruction (WMD), such as a Radiological Dispersal Device (RDD, “Dirty Bomb”) or an Improvised Nuclear Device (IND). The course begins by giving the student a conscious awareness of the fundamentals of radiation, health effects, recognition, and terrorist use of radiation and radiological material. HazMat technicians are given hands-on experience with radiation fields while learning the basic operation of radiation detectors and dosimeters. Students are taught how to use these instruments to conduct surveys of personnel, vehicles, facilities, and outdoor areas. Hands-on activities blend cognitive knowledge of radiation and instruments with survey techniques used in detecting the presence of radiation, locating radioactive material, and measuring levels of radiation and radiological contamination. Once individual and small team skills are mastered, HazMat technicians are taught operational considerations when responding to a radiological WMD incident. These considerations include operating in high radiation areas, limiting responder radiation doses, and rescuing contaminated victims. Students form operational teams that deal with cadre-evaluated realistic drills involving likely terrorist use of radiological material. The course culminates with an evaluation exercise requiring student teams, under a unified command, to respond to a terrorist attack on a facility, disbursing radiological material.

Course Topics:

Fundamentals of Radiation
Health Effects of Radiation
Minimizing Exposure
Recognition of Radioactive Material and WMD
Radiological Material Transportation
Radiological Hazard Assessment
Radiological/Nuclear WMD Threat
Radiation Dosimeters
Gamma Exposure Measurements
Contamination Measurements
Personnel Survey Techniques
Vehicle Survey Techniques
Facility and Area Survey Techniques
Radiological Decontamination
Team Operations at a Radioactive Hot Zone

Course Objectives:

1. Describe the radiological/nuclear threat of WMD and its potential impact on the community.
2. Discuss responsibilities for maintaining exposures to radiation and radioactive material As Low As Reasonably Achievable (ALARA).
3. Explain the health effects of ionizing radiation and operational considerations for HazMat technicians and victims in a WMD radiological/nuclear incident.
4. Apply time, distance, and shielding concepts to reduce exposure while operating in a radiation environment.
5. Operate a variety of radiological instruments to determine the presence and quantity of radiation.
6. Use survey techniques to determine radiological hazards and to make tactical decisions.
7. Describe the design and construction features of containers used for radiological/nuclear material.
8. Describe the issues and considerations associated with managing large-scale radiological/nuclear incidents and apply them to large-scale scenarios.
9. Conduct personnel and equipment decontamination, given a radiological WMD scenario.
10. Describe the effects of a radiological dispersal device (RDD).
11. Formulate the basic tactical procedures for handling a WMD radiological/nuclear incident.

Realistic Training:

This is a “live agent” course that extensively uses real radioactive material. The course is designed and monitored so that students only receive a minor radiation dosage (lower than a chest x-ray or a typical round-trip airline flight across the U.S.); however, radiation levels are sufficient to practice the techniques needed in a real incident involving much higher radiation levels. On the first day of class, each student is issued a radiation meter kit (containing three different types of detectors) and an electronic dosimeter; these are used throughout the course. Students practice with real radioactive material in the classroom, during drills and exercises in venues with more than 75 alpha, beta, beta-gamma, and gamma radiation sources in place. Exercise areas can be configured with thousands of square feet with elevated radiation levels.

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Course Syllabus (continued)

Realistic Training (Cont.):

Students are allowed into radiation fields up to a maximum of 5 mrem per hour (or about 500 to 1,000 times greater than natural background radiation levels). One exercise area includes a former nuclear facility used for testing air-breathing jet engines powered by nuclear reactors. Another exercise area was constructed at ground zero of four nuclear detonations. In 1955, a nuclear device was detonated in a tower above the houses, office buildings, and industrial areas in a simulated town. This exercise area now includes a downtown area (with bus and detonated car “dirty bomb”), strip mall, industrial business area, train station (track destroyed and cars derailed), semi-tractor trailers and car incidents, an airfield (with a detonated truck “dirty bomb”), and a crashed jet liner. The radioactive material that remains in the ground from the nuclear detonation produces radiation levels throughout the exercise area that are higher than normal background levels, yet safe. This allows students to train in an area with simulated widespread radiological contamination from an RDD or IND, without the risks of contaminating themselves.

Course Length:

32 hours (four 8-hour days)

Prerequisites:

Students must be State-Certified Hazardous Materials Technicians.

Target Audience/Disciplines:

The target audience includes students with technician-level training, representing the following disciplines:

- Law Enforcement
- Emergency Medical Services
- Emergency Management Agency
- Fire Service
- Hazardous Materials (HazMat)
- Public Works
- Governmental Administrative
- Public Safety Communications
- Health Care
- Public Health
- Other Skilled Support Personnel that provide immediate support services during prevention, response, and recovery operations.

Certificate:

Certificates of Completion are issued by the DOE/NNSA, National Center for Exercise Excellence, Nevada Test Site. Continuing Education Units (CEUs) are awarded by the University of Nevada, Las Vegas (UNLV).

Eligibility:

This course is primarily intended for responders trained to the HazMat Technician Level. It is the responsibility of the jurisdiction to select course participants.

Course Delivery:

Delivered at the U.S. Department of Energy, National Center for Exercise Excellence, Nevada Test Site.

Cost:

All training and course materials are free to eligible participants.

Contact:

In order to attend a training class delivered by one of the ODP training partners, a request must be provided to the designated training point of contact. For the Training Coordinator in your area, please contact the ODP Help Line at: 800-368-6498.

For more specific information regarding this course, please contact the following:

Registration Desk

Bechtel Nevada

Counter Terrorism Operations Support (CTOS) Program
DOE/NNSA/NSO

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More information can be found at the DOE/NNSA/NSO

Web site: www.nv.doe.gov/combatingterrorism.